#8

SEQUENCE LISTING

<110> Fisher, Paul B.
      Leszcyniecka, Magdalena

<120> GENES DISPLAYING ENHANCED EXPRESSION DURING CELLULAR SENESCENCE AND
TERMINAL CELL DIFFERENTIATION AND USES THEREOF

<130> A34584-A-PCT-USA (070050.1664)

<140> PCT/US00/02920
<141> 2000-02-02

<150> US 09/243,277
<151> 1999-02-02

<160> 51

<170> FastSEQ for Windows Version 4.0

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<213> Homo sapiens

<220>
<221> unsure
<222> 534, 590
<223> a or g or c or t

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<211> 678
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<213> Homo sapiens

<220>
<221> unsure
<222> 566, 669
<223> a or g or c or t

<400> 2

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tctccatgat gtcttcgtta gaaaagtaaa aatgctgaag aagcccaagt ttgaattggg 540
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<213> Homo sapiens

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<222> 656
<223> a or g or c or t

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<213> Homo sapiens

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<222> 530, 534, 650, 651, 655
<223> a or g or c or t

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<213> Homo sapiens

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<223> a or g or c or t

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<211> 445
<212> DNA
<213> Homo sapiens

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<211> 666
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 483, 498, 527
<223> a or c or g or t

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aataaattgt tttgagtgtt ttttgagccc cagacaaata atgtttttaaa gttatcccct 180
tgctacttta ctgatacctt tatcattcct gagacagttt gctaatttaa aaatgtagca 240
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tgncttcctt tatattgngt cttttttatg ttgcatgttg cttttgntat cagcctgatt 540
ttttgctcag tatatgatag ttctgctgat ggtttggtta ttgggcagac atatcttcat 600
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<210> 8
<211> 409
<212> DNA
<213> Homo sapiens

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cattaggctt aaaaacagat gcaattcccg gacgtctaaa ccaaaccact ttcaccgcta 240
cacgaccggg ggtatactac ggtcaatgct ctgaaatctg tggagcaaac cacagtttca 300
tgcccatcgt cctagaatta attccctaa aaatctttga aatagggccc gtatttaccc 360
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<210> 9
<211> 667
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 436, 663
<223> a or c or g or t

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gcatcattaa caagggataa aagtatcaat tctttgaaga aattggtttt aaggaaactt 420
cggagaaagg cattanactg gaaagcttga gcctccttgg gttcgtctac aaattggaag 480
gaaatatgaa tgaagccctg gagtactatg agcgggccct gagactggct gctgactttg 540
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<212> DNA
<213> Homo sapiens

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<222> 585
<223> a or c or g or t

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<212> DNA
<213> Homo sapiens

<220>
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<223> a or c or g or t

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<210> 12
<211> 669
<212> DNA
<213> Homo sapiens

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<221> unsure
<222> 587, 595, 600, 660, 662
<223> a or c or g or t

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ccctgaagct tcaggatgaa ggacaggaaa cttgaaggag aaaagtncat tgaanaactn 600
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tntgggata   669

<210> 13
<211> 702
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 530, 585, 600, 616, 654, 702
<223> a or c or g or t

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<211> 312
<212> DNA
<213> Homo sapiens

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<211> 391
<212> DNA
<213> Homo sapiens

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acatgttgcc aatcagagga tgtgatcaca attcgtaata aaggatccag gagtttttgt 180
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<210> 16
<211> 720
<212> DNA

<213> Homo sapiens

<220>
<221> unsure
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      532, 535, 538, 549, 562, 567, 568,577, 579, 601, 603
<223> a or c or g or t

<221> unsure
<222> 614, 618, 621, 625, 633, 636, 641, 678, 683, 691, 708
<223> a or c or g or t

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ccacagctca gcaaaggctc ctggggtccc gtctgtattg caccagaatc aaaccaacng 360
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ntnccaaccc tgtntttnct gnccncggaa aanacntccc ntgacatatg gctcaaataa 660
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<210> 17
<211> 205
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 158, 159, 161, 163, 176, 182, 186, 189, 191, 193, 197, 1699,
      200, 202, 203
<223> a or c or g or t

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<213> Homo sapiens

<220>
<221> unsure
<222> 479
<223> a or c or g or t

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atatccaaag ctgaatacat tctgctttca tcttggtcac atacaattat ttttacagtt 360
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gtagataaac tcagaaattt aattcatgtt tcttaaatgg gctactttgt cctttttgnt 480
attagggtgg tatttagtct attagccaca aaattgggaa aggagtagaa aaagcagtaa 540
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<210> 19
<211> 483
<212> DNA
<213> Homo sapiens

<400> 19
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ttgattttaa ttagttagga gtatttgagc tgttatttct tgagcttaat attttttag 180
agttaactct ttaaggagat aatcatggct gtagacaagg ccagggctgg ctgacgtgcc 240
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<210> 20
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<212> DNA
<213> Homo sapiens

<220>
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cctccgtggg atttcaggga atttgaagta gaaaaacaga ctgcagaaga aacggggctt 180
acgccattgg aaacctcaag gaaaactcca gattccagac cttccttgga agaaaccttt 240
gaaattgaaa tgaatgaaag tgacatgatg ttagagacat ctatgtcaga ccacagcacg 300
tgactccagt cagtggtcct ggtcccactg tcccagtgta ggttagtatt ccttcacatc 360
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taggaacaga gacccgcctt aagagactgg atcgcacacc tttgcaacag atgtgttctg 480
attctctgaa cctacaaaat agttatacat agtggaataa agaaggtaaa ccatcaaaaa 540
aaaaaaaaaa aaaccncngg gggggcccgg gcccaatttg cccttangg           589
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<210> 21
<211> 713
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 389, 396, 400, 409, 418, 429, 463, 468, 520, 556, 575, 591,
```

594, 613, 635, 641, 650, 666, 680, 682, 700, 704
`<223> a or c or g or t

<400> 21
aattcaagtg cctgattaat tgaggtggca acatagtttg agacgagggc agagaacagg 60
aagatacata gctagaagcg acgggtacaa aaagcaatgt gtacaagaag actttcagca 120
agtatacaga gagttcacct ctactctgcc ctcctcatag tcataatgta gcaagtaaag 180
aatgagaatg gattctgtac aatacactag aaaccaacat aatgtatttc tttaaaacct 240
gtgtgaaaaa ataaatgttc caccagtagg gataggggaa aagtaaccaa aagagagaaa 300
gagaaaggaa tgctggttta tctttgtaga ttgtaatcga atggagaaat ttgcagtatt 360
ttagccacta ttaggaattt tttttttttng taaaangaan actgaactnt gttcaaangc 420
tttcatganc ctggtttgaa acggtaggaa agcaccaaaa cgngggancc tggggactaa 480
gggcctggtg caaggacttg ggaaatggca ttgataatan atgggggggt tttcccccct 540
ttaaaaatgt tggatnttaa gggatataac ccttnttta ctccgaaaat nttntgagaa 600
atcccaaaat tcncggtatg cttggaacca ttganatttt ntagggaaan gccttgaata 660
gcctanacct caaagttggn gngaaccaaa attggagccn ttgncccacc tcc      713

<210> 22
<211> 480
<212> DNA
<213> Homo sapiens

<400> 22
cggcacgaga agaagtggta caggaggaat ttgtgatgat gagctgatct taatcaaaaa 60
tactaaggct cgtacgtctg catcgattat cttacgtggg gcaaatgatt tcatgtgtga 120
tgagatggag cgctctttac atgatgcact ttgtgtagtg aagagagttt tggagtcaaa 180
atctgtggtt cccggtgggg gtgctgtaga agcagccctt tccatatacc ttgaaaacta 240
tgcaaccagc atggggtctc gggaacagct tgcgattgca gagtttgcaa gatcacttct 300
tgttattccc aatacactag cagttaatgc tgcccaggac tccacagatc tggttgcaaa 360
attaagagct tttcataatg aggcccaggt taacccagaa cgtaaaaatc taaaatgatt 420
ggtcttgatt tgagcaatgg taaacctcga gggggggccc ggtacccaat tcgccctata 480

<210> 23
<211> 198
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 21
<223> a or c or g or t

<400> 23
cctgttaaaa gctgttcttg ngtgttacat gtaacagaca tggtaaatat ttgtttacag 60
tctttgttta acaaaccatg catttaagtt taagtgaagt caacaaaaag gaaataggtg 120
tatggatatg tgattttgag attaaagtta gtcttaaaat gtaaaaaaaa aaaaaaaaaa 180
aaaaaaaaaa aaaaaaa                                                198

<210> 24
<211> 414
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 368, 370, 372, 374, 375, 376, 377 383, 386, 389

<223> a or c or g or t

<400> 24
aattcggcac gagaaaagca gtataactgc ctgacacagc gggattgaac gagagaagaa 60
attgttcgtt attgctcaga aaattcaaac acgcaaagat cttatggata aaactcagaa 120
agtgaaggtg aagaaagaaa cggtgaactc cccagctatt tataaatttc agagtcgtcg 180
aaaacgttga cgtgttatag ataagccttg tcattctgta tcaaaaatct gttgtcgttt 240
tctagtaact tcaaattcca ttactccaaa tggcatggtt ttccggtttg taaccataac 300
taaattgtca gtctgacatt taatgtcttt ctatggacaa cattaaatct ccctcccttc 360
tgtagaanan anannnnaaa aanccnccng gggggggccg ggtccccatt cccc       414

<210> 25
<211> 367
<212> DNA
<213> Homo sapiens

<400> 25
aattcggcac gagaaaagca gtataactgc ctgacacagc gggattgaac gagagaagaa 60
attgttcgtt attgctcaga aaattcaaac acgcaaagat cttatggata aaactcagaa 120
agtgaaggtg aagaaagaaa cggtgaactc cccagctatt tataaatttc agagtcgtcg 180
aaaacgttga cgtgttatag ataagccttg tcattctgta tcaaaaatct gttgtcgttt 240
tctagtaact tcaaattcca ttactccaaa tggcatggtt ttccggtttg taaccataac 300
taaattgtca gtctgacatt taatgtcttt ctatgggaca acattaaatc tccctccctt 360
ctgtaaa                                                          367

<210> 26
<211> 432
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 386, 389, 390, 397, 404, 409, 413, 416, 424, 426, 430
<223> a or c or g or t

<400> 26
aattcggcac gaggcagact tgaaacagtt ctgtctgcag aatgctcaac atgaccctct 60
gctgactgga gtatcttcaa gtacaaatcc cttcagaccc cagaaagtct gttccttttt 120
gtagtaaaat gaatctttca aaggtttccc aaaccactcc ttatgatcca gtgaatattc 180
aagagagcta catttgaagc ctgtacaaaa gcttatccct gtaacacatg tgccataata 240
tacaaacttc tactttcgtc agtccttaac atctacctct ctgaattttc atgaatttct 300
atttcacaag ggtaattgtt ttatatacac tggcagcagc atacaataaa acttagtatg 360
aaactttaaa aaaaaaaaa aaaacntcnn gggggncccc ggancccant tcnccntata 420
gggngnccgn tt                                                    432

<210> 27
<211> 398
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 288, 298, 345, 348, 352, 357, 358, 368
<223> a or c or g or t

<400> 27
aattcggcac gagtacaaaa ccagttggtg gtgacaagaa cggcggtacc cgggtggtta 60

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aacttcgcaa aatgcctaga tattatccta ctgaagatgt gcctcgaaag ctgttgagcc 120
acggcaaaaa acccttcagt cagcacgtga gaaaactgcg agccagcatt accccgggga 180
ccattctgat catcctcact ggacgccaca ggggcaagag ggtggttttc ctgaagcagc 240
tggctagtgg cttattactt gtgactggac ctctggtcct caatcgantt cctctacnaa 300
gaacacacca gaaatttgtc attgccactt caaccaaaat cgatntcngc antgtannaa 360
atcccaanac atcttactga tgcttacttc aagatgaa                         398


<210> 28
<211> 232
<212> DNA
<213> Homo sapiens


<400> 28
aattcggcac gagattgtat cggttttata ttacctgttc tgcttcacca ggagatcatg 60
ctgctgtgat actgagtttt ctaaacagca taaggaagac ttgctcccct gtcctatgaa 120
agagaatagt tttggagggg agaagtggga caaaaaagat gcagttttcc tttgtattgg 180
gaaatgtgaa aataaaattg tcaactcttt caaaaaaaaa aaaaaaaaa aa          232


<210> 29
<211> 539
<212> DNA
<213> Homo sapiens


<220>
<221> unsure
<222> 495, 508, 511, 526, 529
<223> a or c or g or t


<400> 29
aattcggcac gagcacaacc agaaagtaag gtgttctact tgaaaatgaa aggagattat 60
tttaggtatc tttctgaagt ggcatctgga gacaacaaac aaaccactgt gtcgaactcc 120
cagcaggctt accaggaagc atttgaaatt agtaagaaag aaatgcagcc tacacaccca 180
attcgtcttg gtctggcact aaatttctca gtcttttact atgagattct aaactctcct 240
gaaaaggcct gtagcctggc aaaaacggca tttgatgaag caattgctga attggatacg 300
ctgaatgaag agtcttataa agacagcact ctgatcatgc agttacttag ggacaattca 360
ctctgtggac atcggaaaac caggggagacg aaggagacgc tggggaggga gagaactaat 420
gtttctcgtg ctttgtgatc tgttcagtgt cactctgtac cctcaacata tatcccttgt 480
gcgataaaaa aaaanaaaaa aaaaaccntc nggggggggcc ccggancccn attccccct   539


<210> 30
<211> 568
<212> DNA
<213> Homo sapiens


<220>
<221> unsure
<222> 274, 278, 283, 291, 308, 314, 324, 326, 327, 331, 341, 355,
      371, 419, 461, 531, 534, 545, 558
<223> a or c or g or t


<400> 30
attccaaacc aagtagtgtc tgtcagccct cttaactctg tgcacgccct atttcagtct 60
tttacatttg ttcttctagg gaatgtatgc atctctatat atattttccc tctcaaaacc 120
agaacatcaa cagtgctgtt tctgacactt cagacatccc acgcaaagcc acattgaatt 180
tttgccaaat gaaaaacaca tccacaatca agttctaaga gggtgtcaag tggggaatat 240
taatattgtt tattattcaa aaatttagtt tatnaaangg aancaaaacc nttgaacctt 300
ttttcccnaa aaanaaggaa aatntnntgt ngaccaaggg ncgaacctga atccnccttg 360
```

```
aaaaattgtt ntctcagaaa ggaaaagcgc cctccagttc ttttacccca agaatttana 420
aaaatttggt ccaagatttt atatgttcag ttgtttatgt ntaaaaataa ctttctggat 480
tttgtggggg aggaccggaa aaggaaggga gtttattcct atgttataca ntanaaactt 540
ccccnataaa atgccatnga tgggttga                                    568


<210> 31
<211> 315
<212> DNA
<213> Homo sapiens


<400> 31
aattcggcac gagcagggag ccgctagtga aaatctggca tgaaataagg actaatggcc 60
ccaaaaaagg aggtggctct aagtaaaact gggattggac agtagtggtg catctggtcc 120
ttgccgcctg agagccccag gagacatcgg ctagagtgac catggctatg ctcccgtctg 180
gaagatgcca gcatctggcc tcccactgtt ttcagctgtg tcccccagtc cgtgtctttt 240
tagaatgtga atgatgataa agttgtgaaa taaaggtttc tatctagttt gtaaaaaaaa 300
aaaaaaaaaa aaaaa                                                  315


<210> 32
<211> 458
<212> DNA
<213> Homo sapiens


<220>
<221> unsure
<222> 342, 355, 365, 368, 375, 381, 385, 414, 445
<223> a or c or g or t


<400> 32
aattcaagga actttacatt gtaagagaaa acaaaacact gcaaagaag tgtgccgact 60
atcaaataaa tggtgaaatc atctgcaaat gtggccaggc ttggggaaca atgatggtgc 120
acaaaggctt agatttgcct tgtctcaaaa taaggaattt tgtagtggtt ttcaaaaata 180
attcaacaaa gaaacaatac aaaaagtggg tagaattacc tatcacattt cccaatcttg 240
actattcaga atgctgttta tttagtgatg aggattagca cttgattgaa gattctttta 300
aaatactatc agttaaacat ttaatatgat tatgattaat gnattcatta tgctncagac 360
tgacntanga atcantaaaa ngatngtttt actctgcaaa aaaaaaaaaa aacncggggg 420
ggggcccggc cccaatttcc ccttntgggg ggggttt                          458


<210> 33
<211> 470
<212> DNA
<213> Homo sapiens


<220>
<221> unsure
<222> 434, 459, 460
<223> a or c or g or t


<400> 33
aattcttatc ttccagaggc tacaattatt ataatggaca atacttttac ctttgtctct 60
aaagatcaga ttagttttat ttgttcactt acgtgctttg attatcccct ctgaattata 120
gaccgagtct tgttgtttag cctaagagaa gatttatgta gtaatttctt ctcaggtatg 180
gaaccacggt cataactaac atgttggcca gaatagaacc actggttaaa catatttat 240
tcaccattaa gtgatcttta tcaatattct ggattagaca caaattacc tttctgggtg 300
tttcttgtaa actatactcc tgtttgaatg ttaaactttg ttgctaaagt ttaattttaa 360
gatgtttgaa tgttcagttt atgtatttga actacaataa accaacccctt tttatataaa 420
aaaaaaaaaa aacntcgagg ggggcccgg ccccaattnn ccctataggg            470
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<210> 34
<211> 261
<212> DNA
<213> Homo sapiens

<400> 34
aattcgaact gtgtgtatgt cagtggaatc aaatcaaaag ccactaacat ggctgtctgt 60
ttcactggac tgtcccattt gctggttaaa aggattgggg cccaaatcct ctggcctagc 120
atttctcagt gtttgctatt cagactgtct aaatacagca tgtgacaagc tgaagaagcc 180
aaatctagca gtcatttctg atttcattat attctccccc tcttcctgct aaaaagacaa 240
aaaacaaaaa aaaaaaaaaa a 261

<210> 35
<211> 309
<212> DNA
<213> Homo sapiens

<400> 35
aattcggcac gagctggaca ccaacagtga tggtcagcta gatttctcag aatttcttaa 60
tctgattggt ggcctagcta tggcttgcca tgactccttc ctcaaggctg tcccttccca 120
gaagcggacc tgaggacccc ttggccctgg ccttcaaacc cacccccttt ccttccagcc 180
tttctgtcat catctccaca gcccacccat cccctgagca cactaaccac ctcatgcagg 240
ccccacctgc caatagtaat aaagcaatgt cacttttta aacatgaaa aaaaaaaaa 300
aaaaaaaaa 309

<210> 36
<211> 243
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 8
<223> a or c or g or t

<400> 36
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ttctgtagct caggagagca cccctccacc ccatttgctc gcagtatcct agaatctttg 120
tgctctcgct gcagttccct ttgggttcca tgttttcctt gttccctccc atgcctagct 180
ggattgcaga gttaagttta tgattatgaa ataaaaacta aataacaaaa aaaaaaaaaa 240
aaa 243

<210> 37
<211> 650
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 546, 553, 573
<223> a or c or g or t

<400> 37
aattcggcac gagtaccatt cagcctgaat ttgctagtgt aggctctaaa tcaagtgtag 60
ttccgtgtga acttgcctgc agaacccagt gtgctttgaa gcaatgttgt gggacactac 120
cacaagcccc ttctggaaag gatgcagaaa agaccccagc agttagcatt tcttgtttag 180

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aacttagtaa caatctagag aagaagccca ggaggactaa agctgaaaac atccctgctg 240
ttgtgataga gattaaaaac atgccaaaca aacaacctga atcatctttg tgagtcttga 300
aaaagatgtg atatttgact tttgctttaa actgcaagag gaaaaagact ccactgaaat 360
tctaagtttg ccaagtagtg taattgaagt ccttgtctgg tcacacagtt taattctatt 420
tttgtaagaa cataatggga ctgcataaca gagttctata ttacaatttt gtgattatta 480
gtacagagta cagctatgct gtgactgttt tggaaagcca gttttaacac tatgttacat 540
ttttgnttaa agnaagttaa accttatata acntaatgac atttgatttc tggattttcc 600
catgataaaa aattaggggg gataaataaa aatggttact ggaatttcaa         650
```

<210> 38
<211> 687
<212> DNA
<213> Homo sapiens

<220>
<221> unsure
<222> 444, 448, 451, 460, 461, 462, 468, 471, 476, 490, 506, 510,
      514, 522, 524, 535, 550, 563, 567, 568, 573, 579, 587, 590
<223> a or c or g or t

<221> unsure
<222> 592, 593, 596, 608, 615
<223> a or c or g or t

<400> 38
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gaattcggca cgagattttt ttatttttca ttttcccctt aggcatattt agtattttc 60
cctcaggcag atcattctga gtgtgcgagt gtgtgtgcac atgttacaaa ggcaactacc 120
atgttaataa aatattcaat ttgaaatcct tttcggtatt tgaattgctt ttgaataatg 180
ttttttatct ggatgtaaca ttgttgcatt agctttttaa ctttcccaag taattgaata 240
cattttatta cttggacttt tataaactct ttccctaccc actataaatg agacattcac 300
agcgttcaag tttgtattaa aggaaaggat tagtttgacc ccttcttttg atggttaatg 360
catacatgca gttaaatccc tttatgcaaa tgtgacactg ctttactagg tcttttagtt 420
atttatttat tttttttttt ttgnccantt nattttttan nntaattnct naaacncatt 480
atttttttn aaaataaaaa aacacnatcn tttnttttta ananttaaac cttantaaat 540
ttttcccccn aaaaaaaatc ccntaanntt ttnaatttnt tgaattnaan annaantaaa 600
ccttttnaa aaccnggcaa aaaaaaaaa aaaaaaaaa aaaaaaaaa aaaaaaaaa 660
aaaaaaaaa aaaaaaaaa aaaaaaa                                 687
```

<210> 39
<211> 2549
<212> DNA
<213> Homo sapiens

<400> 39
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ctatggagta gcgcagggtc tcgagctgtg gccgtggact taggcaacag gaaattagaa 120
atatcttctg gaaagctggc cagatttgca gatggctctg ctgtagtaca gtcaggtgac 180
actgcagtaa tggtcacagc ggtcagtaaa acaaaacctt ccccttccca gtttatgcct 240
ttggtggttg actacagaca aaaagctgct gcagcaggta gaattcccac aaactatctg 300
agaagagagg ttggtacttc tgataaagaa attctaacaa gtcgaataat agatcgttca 360
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gcagtagatg gtgtaaatga gcctgatgtc ctagcaatta atggcgcttc cgtagccctc 480
tcattatcag atattccttg gaatggacct gttggggcag tacgaatagg aataattgat 540
ggagaatatg ttgttaaccc aacaagaaaa gaaatgtctt ctagtacttt aaatttagtg 600
gttgctggag cacctaaaag tcagattgtc atgttggaag cctctgcaga gaacatttta 660
cagcaggact tttgccatgc tatcaaagtg ggagtgaaat atacccaaca aataattcag 720
ggcattcagc agttggtaaa agaaactggt gttaccaaga ggacacctca gaagttattt 780
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gatcctgaga agggtgaaat agaagattat cgtttgctga cagatatttt gggaattgaa 1560
gattacaatg gtgacatgga cttcaaaata gctggcacta ataaaggaat aactgcatta 1620
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aatataaata cattttaatt atttgtacta aaatgctcat ttacatgtgc catttttta 2460
attcgagtaa cccatatttg tttaattgta tttacattat aaatcaagaa atatttatta 2520
ttaaaagtaa gtcatttata catcttaga 2549
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<210> 40
<211> 650
<212> DNA
<213> Homo sapiens

<400> 40
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cattacaggc tgatattaaa ttacctggaa taccaataaa aattgtgatg gaggctattc 120
aacaagcttc agtggcaaaa aaggagatat tacagatcat gaacaaaact atttcaaaac 180
ctcgagcatc tagaaaagaa aatggacctg ttgtagaaac tgttcaggtt ccattatcaa 240
aacgagcaaa atttgttgga cctggtggct ataacttaaa aaaacttcag gctgaaacag 300
gtgtaactat tagtcaggtg gatgaagaaa cgttttctgt atttgcacca cacccagtg 360
ttatgcatga ggcaagaaga cttcattact gaatctgcaa ggatgatcag gagcagcaat 420
tagaatttgg agcagtatat accgccacaa taactgaaat cagagatact ggtgtaatgg 480
taaaattata tccaaatatg actgcggtac tgcttcataa cacacaactt gataacgaaa 540
gattaaacat cctactgccc taggattaga agttggccaa gaaattcagg tgaaatactt 600
tggacgtgac ccagccgatg gaagaatgag gctttctcga aaagtgcttc 650
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<210> 41
<211> 640
<212> DNA
<213> Mus musculus

<400> 41
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aatggtgaca tggatttcaa aatagccggt acaaataaag gaataactgc attacaggct 60
gatattaagt tacctggagt accaattaaa attataatgg aagccatcca acaagcgtca 120
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_gtggcaaaga aggagatact gcagataatg aacaaaacga tttcaaaacc tcgagcatca 180
 agaaaagaaa atggaccagt tgtagaaaca gtaaaggttc cattatcaaa acgagcaaaa 240
 ttcgttgggc ctggtggata tcacttaaaa aaactccagg ctgagacagg tgtaacaatt 300
_agtcaggttg atgaagaaac cttctccata tttgcaccaa cacctactgc aatgcatgaa 360
 gcaagagatt tcattacaga aatttgcaga gatgatcaag agcaacaatt agaatttgga 420
 gcagtttata ccgcgacaat aactgaaatc agagacactg gagtgatggt aaaactgtat 480
 ccaaacatga ctgcagtgct gcttcataat tcacaacttg accaacgaaa gattaaacat 540
 cccactgccc taggactaga ggttggccaa gaaattcagg tcaaatactt tggccgtgat 600
 ccagctgatg gaagaatgag gctttctcgt aaagtacttc                        640
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<210> 42
<211> 705
<212> PRT
<213> Homo sapiens

<400> 42

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Asp Gly Pro Phe Leu Leu Pro Arg Arg Asp Arg Ala Leu Thr Gln Leu
  1               5                  10                  15
Gln Val Arg Ala Leu Trp Ser Ser Ala Gly Ser Arg Ala Val Ala Val
               20              25                  30
Asp Leu Gly Asn Arg Lys Leu Glu Ile Ser Ser Gly Lys Leu Ala Arg
           35              40                  45
Phe Ala Asp Gly Ser Ala Val Val Gln Ser Gly Asp Thr Ala Val Met
       50              55                  60
Val Thr Ala Val Ser Lys Thr Lys Pro Ser Pro Ser Gln Phe Met Pro
65                  70                  75                  80
Leu Val Val Asp Tyr Arg Gln Lys Ala Ala Ala Ala Gly Arg Ile Pro
               85                  90                  95
Thr Asn Tyr Leu Arg Arg Glu Val Gly Thr Ser Asp Lys Glu Ile Leu
           100                 105                 110
Thr Ser Arg Ile Ile Asp Arg Ser Ile Arg Pro Leu Phe Pro Ala Gly
       115                 120                 125
Tyr Phe Tyr Asp Thr Gln Val Leu Cys Asn Leu Leu Ala Val Asp Gly
       130                 135                 140
Val Asn Glu Pro Asp Val Leu Ala Ile Asn Gly Ala Ser Val Ala Leu
145                 150                 155                 160
Ser Leu Ser Asp Ile Pro Trp Asn Gly Pro Val Gly Ala Val Arg Ile
               165                 170                 175
Gly Ile Ile Asp Gly Glu Tyr Val Val Asn Pro Thr Arg Lys Glu Met
           180                 185                 190
Ser Ser Ser Thr Leu Asn Leu Val Val Ala Gly Ala Pro Lys Ser Gln
       195                 200                 205
Ile Val Met Leu Glu Ala Ser Ala Glu Asn Ile Leu Gln Gln Asp Phe
       210                 215                 220
Cys His Ala Ile Lys Val Gly Val Lys Tyr Thr Gln Gln Ile Ile Gln
225                 230                 235                 240
Gly Ile Gln Gln Leu Val Lys Glu Thr Gly Val Thr Lys Arg Thr Pro
               245                 250                 255
Gln Lys Leu Phe Thr Pro Ser Pro Glu Ile Val Lys Tyr Thr His Lys
               260                 265                 270
Leu Ala Met Glu Arg Leu Tyr Ala Val Phe Thr Asp Tyr Glu His Asp
           275                 280                 285
Lys Val Ser Arg Asp Glu Ala Val Asn Lys Ile Arg Leu Asp Thr Glu
       290                 295                 300
Glu Gln Leu Lys Glu Lys Phe Pro Glu Ala Asp Pro Tyr Glu Ile Ile
305                 310                 315                 320
Glu Ser Phe Asn Val Val Ala Lys Glu Val Phe Arg Ser Ile Val Leu
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                  325                      330                      335
Asn Glu Tyr Lys Arg Cys Asp Gly Arg Asp Leu Thr Ser Leu Arg Asn
                  340                      345                      350
Val Ser Cys Glu Val Asp Met Phe Lys Thr Leu His Gly Ser Ala Leu
                  355                      360                      365
Phe Gln Arg Gly Gln Thr Gln Val Leu Cys Thr Val Thr Phe Asp Ser
              370                      375                      380
Leu Glu Ser Gly Ile Lys Ser Asp Gln Val Ile Thr Ala Ile Asn Gly
385                      390                      395                      400
Ile Lys Asp Lys Asn Phe Met Leu His Tyr Glu Phe Pro Pro Tyr Ala
                  405                      410 ·                    415
Thr Asn Glu Ile Gly Lys Val Thr Gly Leu Asn Arg Arg Glu Leu Gly
                  420                      425                      430
His Gly Ala Leu Ala Glu Lys Ala Leu Tyr Pro Val Ile Pro Arg Asp
              435                      440                      445
Phe Pro Phe Thr Ile Arg Val Thr Ser Glu Val Leu Glu Ser Asn Gly
          450                      455                      460
Ser Ser Ser Met Ala Ser Ala Cys Gly Gly Ser Leu Ala Leu Met Asp
465                      470                      475                      480
Ser Gly Val Pro Ile Ser Ser Ala Val Ala Gly Val Ala Ile Gly Leu
                  485                      490                      495
Val Thr Lys Thr Asp Pro Glu Lys Gly Glu Ile Glu Asp Tyr Arg Leu
                  500                      505                      510
Leu Thr Asp Ile Leu Gly Ile Glu Asp Tyr Asn Gly Asp Met Asp Phe
              515                      520                      525
Lys Ile Ala Gly Thr Asn Lys Gly Ile Thr Ala Leu Gln Ala Asp Ile
          530                      535                      540
Lys Leu Pro Gly Ile Pro Ile Lys Ile Val Met Glu Ala Ile Gln Gln
545                      550                      555                      560
Ala Ser Val Ala Lys Lys Glu Ile Leu Gln Ile Met Asn Lys Thr Ile
                  565                      570                      575
Ser Lys Pro Arg Ala Ser Arg Lys Glu Asn Gly Pro Val Val Glu Thr
                  580                      585                      590
Val Gln Val Pro Leu Ser Lys Arg Ala Lys Phe Val Gly Pro Gly Gly
              595                      600                      605
Tyr Asn Leu Lys Lys Leu Gln Ala Glu Thr Gly Val Thr Ile Ser Gln
          610                      615                      620
Val Asp Glu Glu Thr Phe Ser Val Phe Ala Pro Thr Pro Ser Val Met
625                      630                      635                      640
His Glu Ala Arg Asp Phe Ile Thr Glu Ile Cys Lys Asp Asp Gln Glu
                  645                      650                      655
Gln Gln Leu Glu Phe Gly Ala Val Tyr Thr Ala Thr Ile Thr Glu Ile
                  660                      665                      670
Arg Asp Thr Gly Val Met Val Lys Leu Tyr Pro Asn Met Thr Ala Val
              675                      680                      685
Leu Leu His Asn Thr Gln Leu Asp Asn Glu Arg Leu Asn Ile Leu Leu
          690                      695                      700
Pro
705
```

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Met Gly Gln Glu Lys His Val Phe Thr Ile Asp Trp Ala Gly Arg Thr
 1               5                   10              15
Leu Thr Val Glu Thr Gly Gln Leu Ala Lys Gln Ala Asn Gly Ala Val
        20                  25                  30
Met Ile Arg Tyr Gly Asp Thr Ala Val Leu Ser Thr Ala Thr Ala Ser
        35                  40                  45
Lys Glu Pro Lys Pro Leu Asp Phe Phe Pro Leu Thr Val Asn Tyr Glu
    50                  55                  60
Glu Arg Leu Tyr Ala Val Gly Lys Ile Pro Gly Gly Phe Ile Lys Arg
65                  70                  75                  80
Glu Gly Arg Pro Ser Glu Lys Ala Val Leu Ala Ser Arg Leu Ile Asp
                85                  90                  95
Arg Pro Ile Arg Pro Leu Phe Ala Asp Gly Phe Arg Asn Glu Val Gln
            100                 105                 110
Val Ile Ser Ile Val Met Ser Val Asp Gln Asn Cys Ser Ser Glu Met
            115                 120                 125
Ala Ala Met Phe Gly Ser Ser Leu Ala Leu Ser Val Ser Asp Ile Pro
    130                 135                 140
Phe Glu Gly Pro Ile Ala Gly Val Thr Val Gly Arg Ile Asp Asp Gln
145                 150                 155                 160
Phe Ile Ile Asn Pro Thr Val Asp Gln Leu Glu Lys Ser Asp Ile Asn
                165                 170                 175
Leu Val Val Ala Gly Thr Lys Asp Ala Ile Asn Met Val Glu Ala Gly
                180                 185                 190
Ala Asp Glu Val Pro Glu Glu Ile Met Leu Glu Ala Ile Met Phe Gly
        195                 200                 205
His Glu Glu Ile Lys Arg Leu Ile Ala Phe Gln Glu Glu Ile Val Ala
    210                 215                 220
Ala Val Gly Lys Glu Lys Ser Glu Ile Lys Leu Phe Glu Ile Asp Glu
225                 230                 235                 240
Glu Leu Asn Glu Lys Val Lys Ala Leu Ala Glu Glu Asp Leu Leu Lys
                245                 250                 255
Ala Ile Gln Val His Glu Lys His Ala Arg Glu Asp Ala Ile Asn Glu
            260                 265                 270
Val Lys Asn Ala Val Val Ala Lys Phe Glu Asp Glu Glu His Asp Glu
        275                 280                 285
Asp Thr Ile Lys Gln Val Lys Gln Ile Leu Ser Lys Leu Val Lys Asn
    290                 295                 300
Glu Val Arg Arg Leu Ile Thr Glu Glu Lys Val Arg Pro Asp Gly Arg
305                 310                 315                 320
Gly Val Asp Gln Ile Arg Pro Leu Ser Ser Glu Val Gly Leu Leu Pro
            325                 330                 335
Arg Thr His Gly Ser Gly Leu Phe Thr Arg Gly Gln Thr Gln Ala Leu
            340                 345                 350
Ser Val Cys Thr Leu Gly Ala Leu Gly Asp Val Gln Ile Leu Asp Gly
            355                 360                 365
Leu Gly Val Glu Glu Ser Lys Arg Phe Met His His Tyr Asn Phe Pro
    370                 375                 380
Gln Phe Ser Val Gly Glu Thr Gly Pro Met Arg Gly Pro Gly Arg Arg
385                 390                 395                 400
Glu Ile Gly His Gly Ala Leu Gly Glu Arg Ala Leu Glu Pro Val Ile
            405                 410                 415
Pro Ser Glu Lys Asp Phe Pro Tyr Thr Val Arg Leu Val Ser Glu Val
            420                 425                 430
Leu Glu Ser Asn Gly Ser Thr Ser Gln Ala Ser Ile Cys Ala Ser Thr
    435                 440                 445
Leu Ala Met Met Asp Ala Gly Val Pro Ile Lys Ala Pro Val Ala Gly
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            450                    455                    460
   Ile Ala Met Gly Leu Val Lys Ser Gly Glu His Tyr Thr Val Leu Thr
   465                    470                    475                    480
   Asp Ile Gln Gly Met Glu Asp Ala Leu Gly Asp Met Asp Phe Lys Val
                      485                    490                    495
   Ala Gly Thr Glu Lys Gly Val Thr Ala Leu Gln Met Asp Ile Lys Ile
                      500                    505                    510
   Glu Gly Leu Ser Arg Glu Ile Leu Glu Glu Ala Leu Gln Gln Ala Lys
                  515                    520                    525
   Lys Gly Arg Met Glu Ile Leu Asn Ser Met Leu Ala Thr Leu Ser Glu
              530                    535                    540
   Ser Arg Lys Glu Leu Ser Arg Tyr Ala Pro Lys Ile Leu Thr Met Thr
   545                    550                    555                    560
   Ile Asn Pro Asp Lys Ile Arg Asp Val Ile Gly Pro Ser Gly Lys Gln
                      565                    570                    575
   Ile Asn Lys Ile Ile Glu Glu Thr Gly Val Lys Ile Asp Ile Glu Gln
                  580                    585                    590
   Asp Gly Thr Ile Phe Ile Ser Ser Thr Asp Glu Ser Gly Asn Gln Lys
                  595                    600                    605
   Ala Lys Lys Ile Ile Glu Asp Leu Val Arg Glu Val Glu Val Gly Gln
              610                    615                    620
   Leu Tyr Leu Gly Lys Val Lys Arg Ile Glu Lys Phe Gly Ala Phe Val
   625                    630                    635                    640
   Glu Ile Phe Ser Gly Lys Asp Gly Leu Val His Ile Ser Glu Leu Ala
                  645                    650                    655
   Leu Glu Arg Val Gly Lys Val Glu Asp Val Val Lys Ile Gly Asp Glu
                  660                    665                    670
   Ile Leu Val Lys Val Thr Glu Ile Asp Lys Gln Gly Arg Val Asn Leu
              675                    680                    685
   Ser Arg Lys Ala Val Leu Arg Glu Glu Lys Glu Lys Glu Glu Gln Gln
          690                    695                    700
   Ser
   705


<210> 44
<211> 705
<212> PRT
<213> Homo sapiens

<400> 44
Asp Gly Pro Phe Leu Leu Pro Arg Arg Asp Arg Ala Leu Thr Gln Leu
  1                5                   10                   15
Gln Val Arg Ala Leu Trp Ser Ser Ala Gly Ser Arg Ala Val Ala Val
              20                   25                   30
Asp Leu Gly Asn Arg Lys Leu Glu Ile Ser Ser Gly Lys Leu Ala Arg
          35                   40                   45
Phe Ala Asp Gly Ser Ala Val Val Gln Ser Gly Asp Thr Ala Val Met
          50                   55                   60
Val Thr Ala Val Ser Lys Thr Lys Pro Ser Pro Ser Gln Phe Met Pro
65                   70                   75                   80
Leu Val Val Asp Tyr Arg Gln Lys Ala Ala Ala Gly Arg Ile Pro
                  85                   90                   95
Thr Asn Tyr Leu Arg Arg Glu Val Gly Thr Ser Asp Lys Glu Ile Leu
              100                  105                  110
Thr Ser Arg Ile Ile Asp Arg Ser Ile Arg Pro Leu Phe Pro Ala Gly
          115                  120                  125
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Tyr Phe Tyr Asp Thr Gln Val Leu Cys Asn Leu Leu Ala Val Asp Gly
    130                 135                 140
Val Asn Glu Pro Asp Val Leu Ala Ile Asn Gly Ala Ser Val Ala Leu
145                 150                 155                 160
Ser Leu Ser Asp Ile Pro Trp Asn Gly Pro Val Gly Ala Val Arg Ile
                165                 170                 175
Gly Ile Ile Asp Gly Glu Tyr Val Val Asn Pro Thr Arg Lys Glu Met
                180                 185                 190
Ser Ser Ser Thr Leu Asn Leu Val Val Ala Gly Ala Pro Lys Ser Gln
                195                 200                 205
Ile Val Met Leu Glu Ala Ser Ala Glu Asn Ile Leu Gln Gln Asp Phe
    210                 215                 220
Cys His Ala Ile Lys Val Gly Val Lys Tyr Thr Gln Gln Ile Ile Gln
225                 230                 235                 240
Gly Ile Gln Gln Leu Val Lys Glu Thr Gly Val Thr Lys Arg Thr Pro
                245                 250                 255
Gln Lys Leu Phe Thr Pro Ser Pro Glu Ile Val Lys Tyr Thr His Lys
                260                 265                 270
Leu Ala Met Glu Arg Leu Tyr Ala Val Phe Thr Asp Tyr Glu His Asp
                275                 280                 285
Lys Val Ser Arg Asp Glu Ala Val Asn Lys Ile Arg Leu Asp Thr Glu
    290                 295                 300
Glu Gln Leu Lys Glu Lys Phe Pro Glu Ala Asp Pro Tyr Glu Ile Ile
305                 310                 315                 320
Glu Ser Phe Asn Val Val Ala Lys Glu Val Phe Arg Ser Ile Val Leu
                325                 330                 335
Asn Glu Tyr Lys Arg Cys Asp Gly Arg Asp Leu Thr Ser Leu Arg Asn
                340                 345                 350
Val Ser Cys Glu Val Asp Met Phe Lys Thr Leu His Gly Ser Ala Leu
    355                 360                 365
Phe Gln Arg Gly Gln Thr Gln Val Leu Cys Thr Val Thr Phe Asp Ser
    370                 375                 380
Leu Glu Ser Gly Ile Lys Ser Asp Gln Val Ile Thr Ala Ile Asn Gly
385                 390                 395                 400
Ile Lys Asp Lys Asn Phe Met Leu His Tyr Glu Phe Pro Pro Tyr Ala
                405                 410                 415
Thr Asn Glu Ile Gly Lys Val Thr Gly Leu Asn Arg Arg Glu Leu Gly
                420                 425                 430
His Gly Ala Leu Ala Glu Lys Ala Leu Tyr Pro Val Ile Pro Arg Asp
    435                 440                 445
Phe Pro Phe Thr Ile Arg Val Thr Ser Glu Val Leu Glu Ser Asn Gly
    450                 455                 460
Ser Ser Ser Met Ala Ser Ala Cys Gly Gly Ser Leu Ala Leu Met Asp
465                 470                 475                 480
Ser Gly Val Pro Ile Ser Ser Ala Val Ala Gly Val Ala Ile Gly Leu
                485                 490                 495
Val Thr Lys Thr Asp Pro Glu Lys Gly Glu Ile Glu Asp Tyr Arg Leu
                500                 505                 510
Leu Thr Asp Ile Leu Gly Ile Glu Asp Tyr Asn Gly Asp Met Asp Phe
                515                 520                 525
Lys Ile Ala Gly Thr Asn Lys Gly Ile Thr Ala Leu Gln Ala Asp Ile
    530                 535                 540
Lys Leu Pro Gly Ile Pro Ile Lys Ile Val Met Glu Ala Ile Gln Gln
545                 550                 555                 560
Ala Ser Val Ala Lys Lys Glu Ile Leu Gln Ile Met Asn Lys Thr Ile
                565                 570                 575
Ser Lys Pro Arg Ala Ser Arg Lys Glu Asn Gly Pro Val Val Glu Thr
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                580                      585                      590
Val Gln Val Pro Leu Ser Lys Arg Ala Lys Phe Val Gly Pro Gly Gly
            595                      600                  605
Tyr Asn Leu Lys Lys Leu Gln Ala Glu Thr Gly Val Thr Ile Ser Gln
        610                      615                  620
Val Asp Glu Glu Thr Phe Ser Val Phe Ala Pro Thr Pro Ser Val Met
625                      630                      635                  640
His Glu Ala Arg Asp Phe Ile Thr Glu Ile Cys Lys Asp Asp Gln Glu
                645                      650                      655
Gln Gln Leu Glu Phe Gly Ala Val Tyr Thr Ala Thr Ile Thr Glu Ile
            660                      665                  670
Arg Asp Thr Gly Val Met Val Lys Leu Tyr Pro Asn Met Thr Ala Val
        675                   , 680                  685
Leu Leu His Asn Thr Gln Leu Asp Asn Glu Arg Leu Asn Ile Leu Leu
    690                      695                  700
Pro
705


<210> 45
<211> 245
<212> PRT
<213> Artificial Sequence

<220>
<223> Consensus sequence between Homo sapiens OLD-35 and
      Bacillus subtilis PNPase

<400> 45
Asp Arg Leu Gly Leu Ala Ala Gly Gly Asp Thr Ala Val Thr Ala Pro
 1               5                      10                      15
Pro Phe Pro Leu Val Tyr Ala Gly Ile Pro Arg Glu Ser Lys Leu Ser
            20                      25                      30
Arg Ile Asp Arg Ile Arg Pro Leu Phe Gly Gln Val Val Asp Ala Gly
        35                      40                      45
Ser Ala Leu Ser Ser Asp Ile Gly Pro Val Gly Ile Asp Asn Pro Thr
    50                      55                      60
Ser Asn Leu Val Val Ala Gly Lys Ile Met Glu Ala Ala Ala Ile Gly
65                      70                      75                      80
Ile Val Gly Lys Lys Leu Phe Glu Leu Ala Glu Leu Glu Lys Glu Val
                85                      90                      95
Glu Val Arg Ile Glu Arg Asp Gly Arg Arg Ser Glu Val His Gly Ser
            100                     105                     110
Leu Phe Arg Gly Gln Thr Gln Leu Thr Leu Asp Lys Phe Met His Tyr
        115                     120                     125
Phe Pro Glu Gly Gly Arg Arg Glu Gly His Gly Ala Leu Glu Ala Leu
    130                     135                     140
Pro Val Ile Pro Asp Phe Pro Thr Arg Ser Glu Val Leu Glu Ser Asn
145                     150                     155                     160
Gly Ser Ser Ala Ser Cys Leu Ala Met Asp Gly Val Pro Ile Val Ala
                165                     170                     175
Gly Ala Gly Leu Val Glu Tyr Leu Thr Asp Ile Gly Glu Asp Gly Asp
            180                     185                     190
Met Asp Phe Lys Ala Gly Thr Lys Gly Thr Ala Leu Gln Asp Ile Lys
        195                     200                     205
Gly Ile Glu Ala Gln Gln Ala Glu Ile Leu Met Thr Ser Arg Pro Thr
    210                     215                     .220
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Lys Gly Pro Gly Lys Glu Thr Gly Val Ile Thr Ser Ala Ile Gln Leu
225                 230                 235                 240
Gly Val Lys Leu Glu
                245


<210> 46
<211> 47
<212> RNA
<213> Homo sapiens

<400> 46
uaauauuuau auauuuauau uuuuaaaaua uuuauuuauu uauuuaa            47

<210> 47
<211> 11
<212> RNA
<213> Homo sapiens

<400> 47
uauuuauuua a                                                   11

<210> 48
<211> 33
<212> RNA
<213> Homo sapiens

<400> 48
uauuuauuua aauauuuaaa uuuuauauuu aau                           33

<210> 49
<211> 62
<212> RNA
<213> Homo sapiens

<400> 49
guuuuuaauu uauuuauuaa gauggauucu cagauauuua uauuuuuuau uuuauuuuuu 60
uu                                                             62

<210> 50
<211> 111
<212> RNA
<213> Homo sapiens

<400> 50
auuuacaugu gccauuuuuu uaauucgagu aacccauauu uguuuaauug uauuuacauu 60
auaaaucaag aaauauuuau uauuaaaagu aagucauuua uacaucuuag a        111

<210> 51
<211> 34
<212> RNA
<213> Homo sapiens

<400> 51
aauuaauuua uuauuuauuu auuauuuauu uauu                          34
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